



## Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact [support@jstor.org](mailto:support@jstor.org).

## SOME ECONOMIC DATA FROM *CIL*, VOLUME XV

BY TENNEY FRANK

The Romans, greedy as no other people for political history—a score of statesmen had written the story of the nation before Livy—concerned themselves very little with the history of industry and commerce, the machinery of which lay largely in the hands of their slaves and of foreigners. Except for some agricultural treatises, the volume of Frontinus on the water supply of Rome, and a few books of Pliny devoted to the technical methods of production, Roman writers have left the economist to the mercy of parentheses, obiter dicta, and the mute objects brought to light by the excavator's spade. In the latter class, however, there are various articles of metal, clay, and glass which provide significant trade-marks and signatures and are well represented by the Roman collection published in the fifteenth volume of the *Corpus of Inscriptions*. It is my purpose in this paper to submit these brief inscriptions to examination, for, though they fail us in many lines of inquiry, they shed some light upon two matters not void of interest, namely, the scale of production<sup>1</sup> and the social status of the producer. In order that the resulting facts may be available for definite historical use, I have confined my observations to a limited period comprising the end of the Republic and the early part of the Empire, a period through which it is possible to trace a certain homogeneity of social conditions.

The table-ware that was most popular in Augustus' day was a red glazed pottery ornamented with designs in low relief and called, after the most important city of manufacture, Arretine ware.<sup>2</sup> It frequently bears the stamp not only of the manufacturer but also of the particular craftsman who designed the piece, or rather the mold from which the piece was turned; for the processes were those of mass production in a factory rather than of individual craftsmen's shops. The designer, for instance, produced a variety of stencils,

<sup>1</sup> For studies on these questions see especially Bücher, *Die Entstehung der Volkswirtschaft*, 1904; Gummerus, *Der römische Gutsbetrieb*, *Klio*, Beiheft 1906; E. Meyer, *Die Sklaverei im Altertum*; and *Die wirtschaftliche Entwicklung des Altertums*.

<sup>2</sup> See *Corpus Inscript. Latin.*, XV, 702, and XI, 1081; Chase, *Catalogue of Arretine Pottery* [with bibliography], 1916.

probably in clay, with patterns of leaves, geometrical designs, or human figures posturing, etc., and with these he would stencil running friezes, not into each bowl, but into a mold which could serve for the production of hundreds of bowls. The designer was a trained craftsman who could model in clay and who had some taste in the composition of patterns, but we need hardly suppose that he was an original artist like the men who so frequently produced exquisite work in the famous Greek vases; for in Arretine ware the patterns were usually borrowed from those of silver plate.

To judge from the instances in which we can actually apply a test to the form of the signature,<sup>1</sup> the designer was usually a slave or a freedman. If the designer was a slave we may be fairly sure that the ordinary laborers were. The owners of the factories are of course Roman citizens, but it is surprising how frequently they bear a foreign cognomen, a fact which implies that they or their ancestors of no remote date had come up from slavery. Indeed some of the owners appear to be the very persons who designed the patterns of an earlier style, an indication that the slave-artists sometimes secured their freedom and a sufficient competence to gain possession of their masters' factories.

The extensive proportions of some of the factories are proved beyond a doubt. So, for instance, the ware of certain firms has been found, not, to be sure, over the whole Roman world—for each firm seems to have supplied the regions opened by the natural arteries of trade—but at least over half of the Mediterranean basin. Indeed for one period it is true that the potteries situated in three districts, i.e., near Puteoli, at Arretium, and in the valley of the Po, supplied the whole demand for moderately good table-ware throughout the Empire, excepting only the southeast. The scale of production<sup>2</sup> is also indicated by the great number of workmen engaged in certain firms. That of Cornelius, for instance, has provided the names of some forty designers; to be sure, they were not all con-

<sup>1</sup> See *Am. Hist. Review*, 1916, p. 693, for criteria; also Oxé, *Rheinisches Museum*, 1904, p. 28. By way of contrast it may be noted that the Calenian ware of two centuries earlier seems to be designed almost wholly by the shop-owners, who were free citizens. See Pagenstecher, *Die calenische Reliefkeramik*, pp. 148 ff.

<sup>2</sup> See *Notiz. degli Scavi*, 1896, p. 455, for the description of a large workroom. The mixing-vat had a capacity of 10,000 gallons. The accounts of the Gallic potteries also prove large-scale production; see Déchelette, *Les vases céramiques de la Gaule*, p. 91.

temporaneous, but at any rate a single designer could keep a large number of mixers, potters, and furnacemen busy, since he presumably merely made the molds and touched up the designs. Calidius Strigo had at least twenty designers, Perennius as many, and there were a dozen other firms of goodly proportions at Arretium. Finally, mass production with a view to extensive trade is disclosed in the establishment of branch factories in Gaul and elsewhere, the purpose being, of course, to save what was in that day the heavy item of freight. Indeed the home factories were eventually put to rout by these new ones, whether because the clays of Gaul were better, the makers more enterprising, or the provincial market more conservative when fashions began to change in Italy. So, for instance, a consignment of red ware that had reached Pompeii shortly before the eruption—the box had not yet been opened—contained more Gallic pieces than Italian, although the box had apparently been packed at Rome.<sup>1</sup>

In this industry, then, we find the machinery of an extensive factory production of articles intended for wide distribution. Of course the student of Roman society sees in this instance an exception to, rather than an example of, the usual rule, but it is apparent that conditions here favored the development of large-scale production. Two elements were of prime importance. One was the quasi-trade-secret involved in the making of the paste, for, though there was no copyright and this particular clay could be and in fact was manufactured in several places, exact knowledge of a rather intricate formula was after all essential. Secondly, a designer of some skill, training, and taste was required; consequently competition could not spring up overnight, and the expense of keeping a skilled designer naturally suggested the advisability of gathering under him enough unskilled labor to occupy his time. Hence it is that this industry developed in a way that was rather unusual in the Roman world.

By way of contrast both in workmanship and in conditions of production it is interesting to compare the manufacture of another article of pottery, namely, the ordinary clay lamp,<sup>2</sup> millions of which

<sup>1</sup> See Atkinson, *Journal of Roman Studies*, IV, 27.

<sup>2</sup> See *CIL*, XV, 784; Fink, *Sitzungsab. Akad. München*, 1900; Loeschcke, *Keramische Funde in Haltern*, p. 210.

must have been manufactured every year and sold for a very few cents apiece. Many of these lamps have a little decoration, but seldom does a pattern show any real worth. They were turned out in molds by an ordinary potter, and the clay paste was little better than that used in good roof-tiles. Furthermore, they were so cheap that it would hardly have been worth while to ship them any considerable distance. To be sure, the recurrence in all parts of the world of certain types of lamps bearing a well-known firm-name succeeded until recently in deceiving archaeologists into thinking that certain firms commanded the trade over wide areas. But it has now been proved<sup>1</sup> by measurement that the greater number of these lamps came from local potteries that simply used various shapes successively popular at some center like Rome, importing the originals and using them, firm-name and all, as molds. Since, then, in the absence of protective copyright, there was here no difficult formula or trade-secret to aid in excluding competition and no great economic inducement for gathering considerable labor and a definite requisite overhead expense, the industry scattered in such a way that local potteries usually supplied the needs of each locality. Concerning the class of labor used we have some indications. The firm-names are usually in briefest form, a cognomen alone, though in early examples good Roman gentile names occur. Judging from the frequency of Greek cognomina we may suppose that the potteries which produced these cheap wares fell into the hands of the class that in general managed Rome's industries, at least in the early Empire, i.e., the freedman.

Certain developments of the glass industry in Augustus' day<sup>2</sup> bring us back to conditions not unlike those of the red glazed pottery. Glass-making apparently grew out of the art of surface-glazing in Egypt at a very early age, and in Roman times the glassware of Alexandria, chiefly mosaics of varicolored glass pastes, was shipped the world over. It is likely that there were very large factories in Egypt, but since the ware bears no trade-mark and since it was successfully copied at Rome and elsewhere we are quite unable to deter-

<sup>1</sup> See Loescheke, *op. cit.*, p. 210.

<sup>2</sup> Kisa, *Das Glas im Altertum*, pp. 261 ff., 702 ff.; Eisen, in *Am. Jour. Arch.*, 1916, p. 143; Morin, *La Verrerie in Gaule*, 1913; *CIL*, XV, 871.

mine the proportions of monopolistic production. There is, however, a translucent glass of Rome, usually figured and signed, and apparently made with the blow-pipe, that provides some little information of value. When Strabo says that in his day certain new inventions at Rome had greatly increased the production of glass and brought down the price to a cent or two per article he may well be referring to the discovery of the process by which a bubble of glass paste was manipulated by means of the blow-pipe. It is obvious why this method revolutionized the production of clear glass. Hitherto for the making of bottles and for many shapes of beakers a new mold had to be shaped for each individual article, a labor-consuming process, and one which, because of the sand and clay of the mold, left the article far from clear. With the blow-pipe a permanent outer mold was used which might contain the figured pattern—figures were the fashion in all wares of Augustus' day—and the glass-blower with the use of his pipe could force the paste to fill the mold and assume the pattern desired. The product was clearer and smoother and the work was far more rapidly done than by the old method. It is not surprising that the maker of the new glass, inartistic though it was, showed such enthusiasm over the new process as to put his name in prominent letters upon the pattern. The ware, which can readily be distinguished, is not only found widely distributed, but the maker's name is printed in Greek as well as in Latin, apparently on the supposition that the articles would find a wide sale.

Here again, as in the case of Arretine ware, conditions favorable to monopolistic production existed. Whether or not modern methods can extract glass paste with ease out of the sands and pozzolanas of Italy everywhere, it is clear from Strabo and Pliny that the ancient glass-maker had great difficulty in finding a tractable sand. This alone prevented much competition. Moreover, the new invention made a peculiar distribution of specialists necessary. Hitherto the workman who handled the hot glass paste at the furnace must also be skilled at molding it quickly into the desired pattern. By the new process one designer could shape any number of exterior molds, and any number of glass-blowers might produce the articles on these molds, given only the special skill in glass-blowing. Thus

again it was good economy to gather labor into one place and about one designer.

There is one additional fact of interest here that deserves mention in passing. The manufacturers of this signed glass bear Greek names and call themselves natives of Phoenician Sidon. It may be that some of the factories were in Sidon; at least Ennion's work is found mainly in that region. On the other hand, the work of Artas, Neikon, and Ariston appears mostly at Rome. Either we are dealing with an eastern product that captured the trade of Rome, or, what is more likely, we are dealing with skilled artisans and manufacturers who, realizing that Rome offered the best market, set up their main factories there or nearby.

The brickmaking<sup>1</sup> industry was another which tended toward factory and monopolistic methods at Rome, though for a very different set of reasons. During the Republic the industry found little encouragement. Public buildings were largely made of tufa-blocks, and when concrete was introduced it came to be lined with stone, large blocks or small squares set in cement. Clay was burnt chiefly for roof-tiles. In the early Empire till Claudius' day the stone facing and *opus reticulatum* still continued in vogue, though broken roof-tiles were also introduced for the facing of concrete walls. In the reign of Claudius, however, brick-facing became more general so that brickyards had to supply new forms in addition to the roof-tiles. It was in Nero's reign, especially when, after the famous fire, a great part of the city had to be rebuilt, that the brick industry came to its own. It is evident that the brick kilns then in existence had to supply an inestimable quantity of material for the facing of concrete walls, and brick-faced concrete remained the standard material for construction thenceforward.

There were of course both centrifugal and centripetal forces in this industry at Rome as elsewhere. The recipe was centuries old, and by no means a secret. Furthermore, good clays for bricks were abundant. To be sure, the excellent Pliocene shales behind the Vatican that now feed the great kilns of Rome seem not to have been exploited to any great extent in ancient times, but the alluvium of the Anio and of the Tiber that combines the limestone silt of the

<sup>1</sup> *CIL*, XV, 1 ff.; Van Deman, *Am. Jour. Arch.*, 1912, pp. 247 ff.

Apennines with the volcanic pozzolanas of Latium still produces some of the finest red bricks of Rome, and here, to judge from the texture of the old bricks and from the brick stamps, were the chief yards of old Rome. That supply was inexhaustible and could not well be controlled by any single firm.

Since the product was too heavy for ready transport, it was not easy for a firm to secure control of the trade over large areas. Only in very few instances do the ancient brick stamps appear widely distributed. Bricks from Roman yards were of course barged down to Ostia, and some wares of the Campanian and even the Ligurian and Gallic coasts went by sea to Rome's seaport and vice versa, possibly as ballast. Yards on the Tiber above Rome, even a hundred miles away, gained a market down the river, and when a particularly good article was desired by a nobleman for his Alban villa he would pay the expenses of a costly transport from the metropolis; but this list fairly completes the cases of trans-shipment.

And yet certain brick firms at Rome grew to immense proportions, owing possibly to a capacity and ability to grasp the opportunities offered. Interesting in this connection is the growth of the property of the famous Gallic orator, Domitius Afer. Arriving at Rome a poor man in the reign of Tiberius, he gained wealth and political position by his remarkable gift of speech, ready wit, and calculating devotion to the reigning prince. Like any Roman ambitious to establish a social position, he invested in landed estates, and it was probably in this way that he became an owner of a brickyard; for tile-burning was still looked upon as a legitimate branch of agriculture and therefore respectable beyond the run of ordinary business. The times were auspicious, for bricks were just working their way into fashion. Afer's adopted sons and heirs, Tullus and Lucanus, profiting doubtless by the devastating fire that destroyed most of Rome, perhaps also skilfully using for business purposes the political influence which they both inherited from their ennobled father, extended their enterprises enormously, acquiring, as their trade-marks show, the yards of several different estates which they finally conducted under a score of managers. There is hardly a public or private building of importance during their period—an epoch of enormous building activity—where their trade-mark is not prominent,



if not predominant, among the brick stamps found. These, by the way, are the properties which formed the main group of the imperial yards of a later day, for they passed by inheritance through the hands of Lucilla, the daughter of Lucanus, to her grandson, who became the emperor Marcus Aurelius. In his day, indeed, the brickyards of Rome had largely become imperial property, well-nigh an imperial monopoly, a situation which, however, was largely due to the accident of intermarriage between the families that owned the chief yards at the beginning of the second century and the succession by due inheritance into the family of the Annii.

It deserves notice, by the way, that brickmaking is practically the only industry at Rome in which the aristocrat does not hesitate to display his connections with the profits of a factory. The reason probably lies in the associations with agriculture already mentioned. The Roman noble was supposed to be a landlord, and it was always proper for him to be intimately acquainted with all the processes of agriculture and to develop all the resources of this land, be this by grain- or stock-raising or turning a clay bank into a tile yard. Indeed Asinius Pollio was one of the first nobles at Rome to have his name stamped upon tiles which he apparently made at his Alban villa, and there is little reason to doubt that the tiles bearing the name of Tuli from the vicinity of Tusculum were made at the favorite Tusculan villa of Cicero.

This fact again explains a peculiar business practice in the association of owner and slave-manager of such factories, for brick stamps usually indicate both the owner and the superintendent of the yard, the latter invariably a slave or freedman. The practice of course simply continues the conditions that regularly held upon the large landed estates. The landlord seldom leased his lands; he rather cultivated them himself, placing a trusted slave or freedman in charge of his property, a position of considerable responsibility and dignity. It is apparent that the superintendent of the brickyards who was permitted to stamp his name upon the brick with that of his master corresponds in every way to the *vilicus* of the estate.

The iron trade furnishes another example in which favorable conditions, though quite different from those cited, tended to lift an industry out of the conservative methods of the small-shop system.

Rome is of course full of indications that the smith or worker in iron was usually the keeper of a small shop with a single forge where he and perhaps his apprentice made his one specialty and sold it as well. In the Vatican Gallery there stands a typical illustration of such a shop, for upon one side of a tombstone is represented the smith at his forge hammering out his blade or whatever the object may be; on the other he stands represented by the side of his petty rack of knives and sickles making a sale to a customer. That this is typical of Roman trade becomes painfully apparent to anyone who walks up and down the monotonous streets of Pompeii with their endless succession of one-room shops shaped so frequently with a furnace or work-bench in the rear and a display-window on the street. Or one may read the same implication upon the thousands of inscriptions of humble workmen who have recorded their one special capacity in life. These craftsmen are very seldom workers in iron and smiths in a general sense. They call themselves shield-makers, sword-makers, sickle-makers, helmet-makers,<sup>1</sup> and so on. They knew one craft, practiced and lived by it at home, and the streets of Rome were lined with the shops of craftsmen, who lived and let live, never for a moment disturbed by nightmare fears of a possible steel trust.

And yet the danger was at one time not far off. When first we hear of iron production in Italy we are told that the island of Elba furnished a limitless supply of ore—it is still Italy's chief source. On the mainland opposite, where wood was plentiful, the ore was smelted. Cities nearby early specialized in iron; so, for instance, the city of Arretium presented an immense quantity of weapons of offense and defense to Scipio during the Punic War.<sup>2</sup> When Rome founded the colony of Puteoli in the Bay of Naples, the only good harbor of Central Italy, the iron industry seems to have shifted thither. The reasons seem to be that Puteoli lay near the richest agricultural region of ancient Italy where tools and instruments were in constant demand; it also commanded the large forests of the Phlegrean fields; it had a harbor that would take a ship of any draft

<sup>1</sup> Cf. *CIL*, VI, Nos. 9886, 2196, 1952, 9442, 9260; II, No. 3357; X, Nos. 3984, 3987. Cic. *Cat.* i. 8 mentions a place in Rome as being *inter falcarios*.

<sup>2</sup> See Livy xxviii. 45.

of that day; it was the emporium for the army supplies of most of Rome's foreign armies, and for these, contracts for thousands of stands of arms were constantly being let by the state. It is not difficult then to see the full significance of Diodorus' (v. 13) words written at the beginning of Augustus' reign to the effect that the pig iron of Tuscany was taken by the manufacturers of Puteoli who made weapons and armor and farm instruments for the trade of the whole world. The language may be a trifle exaggerated, and we must confess that there is nothing left to aid us in determining whether a real factory organization was developed or whether a mere collection of individual forges, as it were, is meant, whether trained slaves were impressed, or whether a body of skilled artisans was employed. At any rate, this is the language of capitalistic production and what might reasonably be called international economy. It was here the result of a favorable collocation of conditions in connection with the production of armor, an article for which contracts were likely to be let in great bulk. The man who had the daring and the capital to anticipate the needs by laying up a few thousand suits of armor in standard sizes at Puteoli could well-nigh command his own price when wars broke out. What became of his industry we do not know. In the fourth century, after the emperors had repeatedly met the sad experience of finding at a critical moment that all the available arms on the market had been secured by a rival, the state was compelled to make a monopoly of the whole industry of armor-making.

A certain contrast is afforded by the manufacture of water pipes—always made of lead—in which the factory system failed to emerge despite the fact that large orders were placed for standard sizes. Here we get our information partly from Frontinus' business-like account of the water supply of Rome, but mainly from the stamps upon the pipes which indicate owner and maker.<sup>1</sup> In general, the imperial water bureau provided for the main aqueducts of Rome and for the distribution of water to all public places, that is, to the imperial palaces, to the public baths and gardens, and to a large number of free public fountains whence the poor carried their water. In Frontinus' day the bureau owned some seven hundred slaves to do the requisite work, a part of which consisted in making and laying

<sup>1</sup> *CIL*, XV, 906.

the lead pipes of the public service; indeed such pipes usually bear the name of the maker besides those of the water commissioner and the emperor. And here it is interesting to find that the bureau not infrequently has to employ the services of independent plumbers,<sup>1</sup> as Frontinus himself (chap. 119) implies in his statement that he is compelled to let contracts for part of his work.

At Rome, however, the larger amount of lead pipe was contracted for by private individuals who had secured water rights, a group that included most of the well-to-do of the city. Such pipe was quite regularly stamped with the owner's name in order to afford ready identification in case of repairs—for often several lines lay parallel to each other under the street. Usually the maker also took this occasion to have his own name recorded. Now these names reveal some singular circumstances. From the great mass of material recovered and the numerous names recorded, it does not appear that any one firm secured large contracts or tried to build up a stock for large orders, although Frontinus shows that certain standard sizes were in demand. A maker's name, in fact, very seldom recurs in two widely separated regions of the city, and furthermore when a contract is large it is apparently divided among several plumbers.<sup>2</sup> Moreover it is clear that the names stamped upon the pipes were almost invariably a part of the original mold, which indicates that the pipe was made to order and that no stock was accumulated. The system in vogue therefore was this: small shop-owners with a few slaves, with no large capital, and with few facilities, took the orders when they came, bought the metal, melted it and rolled it into plates which were cut into the requisite strips and soldered into pipes, and finally laid and connected it. That is to say, the plumber was also the maker of the pipe. Why this time-consuming system was conserved it is difficult to understand. Of course since the city laid few mains, and the private citizen who desired water had frequently to conduct it for long distances, it was exceedingly important that the owner's name should be stamped in enduring form, a point certainly secured by this system; but other ways of attaining the same result are conceivable. It would seem

<sup>1</sup> See *CIL*, XV, Nos. 7279–83, 7289, 7309; cf. 7325 with 7523, 7333 with 7409.

<sup>2</sup> Cf. *CIL*, XV, Nos. 7369–73.

that the inertia of this industry is simply an illustration of how tenaciously the small-shop system conserved itself against obvious economic inducements toward centralization—a phenomenon too well known and recognized to need further illustration.

That the people engaged in this trade, if independent shop-owners, were frequently freedmen, or of the same general class as freedmen, is shown by the frequent recurrence of the Greek cognomina. Often indeed they are simply practicing a trade which as slaves they had learned in the imperial or municipal water bureaux. Thus the plumber who laid the pipes of the great villa on the Appian Way<sup>1</sup> was an imperial freedman, and at Ostia several plumbers bear the descriptive name of Ostiensis in lieu of family names.

Finally, to join extremes, the signatures of Roman cameos<sup>2</sup> and intaglios are interesting in disclosing a few facts regarding the source of labor in one of the finest crafts. In ancient days this art assumed very significant proportions for the reason that every man of the least consequence must have his own signet ring, and in the later days of the Republic the aristocratic Romans commanded the services of the very best gem-engravers for these seals, many of which are still treasured as works of exquisite art. There are of course all grades of work. Dioscurides, who was summoned from the East to make the imperial seal, was looked upon as an artist of high rank, and he doubtless did not need to keep a shop. He is a fair instance of the Greek and oriental artisans who drifted to Rome with the tide of wealth. At the other extreme, possibly, are the craftsmen known from humble tombstone inscriptions who designate themselves as being gem<sup>3</sup>-engravers from the "Sacred Way," the jewelers' street. Here was apparently a row of shops where such craftsmen took orders and worked. Their names seem to indicate that they are freedmen. Possibly they had been trained as slave apprentices and had saved enough by extra labor to purchase freedom and set up shops of their own. Finally, there is a peculiar group of signatures written in Greek, though with Latin praenomina. Presumably

<sup>1</sup> *CIL*, XV, No. 7799.

<sup>2</sup> Fürtwängler, *Antike Gemmen*, p. 300, and plates Nos. 49 and 50; also in *Arch. Jahrb.*, 1888.

<sup>3</sup> Cf. *CIL*, Nos. 9433–36, 9545–49, 33872.

these designate men who were also immigrant artists but who had gained citizenship—the right to use the Roman form of name—by direct gift of the state, perhaps in recognition of their work. That is to say, they use the Roman prenomen to distinguish themselves from the freedmen, but write the name in Greek as a means of suggesting the fact that their work is not merely crude native cutting. These signatures then seem to indicate that for one fine craft at least Rome had to draw largely upon the artisans of Greece and the East and that good work was recognized as deserving the gift of citizenship. The more ordinary grades of work fell to the slave apprentice, and the business of the small shops was conducted here, as in other trades, by the freedman class. Production on capitalistic lines was naturally out of question, not only because customers insisted upon having the special attention of some recognized artist, but because most of the work had to be done to order.

The data afforded by the inscribed articles here discussed are obviously not sufficient to provide a foundation for broad generalization. All they permit us to say is that the industries at the beginning of the Empire illustrate more or less adequately the tendencies still at work. Certainly Bücher's theory that Roman industry must be classed under the rubric of domestic economy fails wholly to fit the situation, while, on the other hand, the exaggerated modernity of Eduard Meyer's description of ancient industry must be tempered by a reminder that his examples are quite exceptional. Our study seems to permit the conclusion that large-scale production might emerge in the manufacture of goods ordinarily demanded in large quantities at irregular seasons, as, for example, arms and armor, farm implements, and bricks—though we must add that for seemingly trivial reasons the manufacture of water pipes proves to be an exception. Monopolistic tendencies often appeared when the producer could command the supply of a somewhat rare raw article, or had possession of a trade-secret or a formula not generally known, or when the employment of some highly skilled and expensive specialist necessitated the distribution of overhead costs by the largest possible use of his time. The glass and pottery industries seem to illustrate these points. Again, unusual enterprise or perhaps the command of exceptional facilities for supplying the market in

times of special need—as, for example, in the brick trade—might evolve factory methods when other inducements were wanting. Needless to say, however, such monopolistic tendencies were quickly counteracted when the articles manufactured were too cheap to bear the cost of transportation charges, as the circumscribed distribution of the clay lamps indicates.

It is apparent that labor, skilled as well as unskilled, had in general fallen into the hands of slaves and ex-slaves by the end of the Republic, and furthermore that most of the small shops and many of the larger firms were owned and managed by ex-slaves. These facts have of course no little importance for the comprehension of Roman society and politics; but what concerns us here is the bearing they have upon the main question of production. The conservatism of Roman business, the aversion to combination and expansion, the lack of inventiveness and of initiative, are usually attributed to a supposed lack of capital—as though Rome in Augustus' day was not completely supported by the profits of capitalistic investments! The abundance of slaves not only encouraged legitimate home-industry, but catered to the whims of the fastidious householders who preferred to have everything possible made to order according to their personal tastes—a condition not calculated to help the marketing of factory-made goods. Moreover, this plentiful supply of cheap labor discouraged a demand for new labor-saving processes which on the one hand might have created new products for a potential market and on the other hand might have produced inventions, trade-secrets, and costly collections of tools, all potential factors in concentration and monopoly. Finally, it is obvious that the slaves and freedmen by their very lack of initiative must have clogged the machinery of industry, while with all its servile associations business enterprise in general failed to attract men of large capacities and driving energy. In a word, Rome's industrial system had during Augustus' reign developed about as far as could be expected in a régime of slave labor.